

## CLAIMS

What is claimed is:

1. An integrated digital x-ray imaging system for dental radiography, comprising:

5 an x-ray source;

a source control unit operably connected to the x-ray source which controls the operation of the x-ray source and the exposure settings of the x-ray source;

a control panel coupled to the source control unit which provides exposure settings to the source control unit;

10 an image sensor positioned for receiving x-ray radiation from the x-ray source passed through a patient, and for delivering an analog output x-ray image of the patient;

a sensor driver/processor coupled to the image sensor receiving the analog output x-ray image from the image sensor, wherein the sensor processor interfaces with the source control unit for receiving the exposure settings of the x-ray source;

15 an image processor for converting the analog output x-ray image received from the image sensor to a digital format image and for processing the digital format image; and

a display for presenting the digital format image.

2. The digital x-ray imaging system of claim 1 wherein the exposure settings comprise pre-determined x-ray exposure times based on the category of tooth and the physical size of the patient.

3. The digital x-ray imaging system of claim 2 further comprising a  
5 calibrator for calculating the exposure settings based on certain anatomical parameters of the patient.

4. The digital x-ray imaging system of claim 3 wherein the anatomical parameters used for calculating exposure times are based on the category of tooth and the physical size of the patient.

10 5 The digital x-ray imaging system of claim 4 wherein the image sensor is a CCD or CMOS x-ray image detector.

6. The digital x-ray imaging system of claim 5 wherein the display comprises a personal computer monitor, a flat panel display, or a television.

7 The digital x-ray imaging system of claim 6 wherein an additional display  
15 is supplied on the sensor processor.

8. The digital x-ray imaging system of claim 7 wherein the display supplied is a flat panel display located on the control panel.

9. The digital x-ray imaging system of claim 8 wherein the control panel comprises a portable PDA-type device.

10. The digital x-ray imaging system of claim 9 wherein the image processor comprises digital detection software supplied with the sensor processor.

11. An integrated digital x-ray imaging system for dental radiography, comprising:

5 an x-ray source;

a source control unit operably connected to the x-ray source which controls the operation of the x-ray source and signals pre-determined x-ray exposure times based on the category of tooth and the physical size of the patient and displays the a x-ray image;

10 a control panel coupled to the source control unit which provides exposure settings to the source control unit and comprises a PDA-type device with a flat panel display;

a CCD image sensor positioned to receive x-ray radiation from the x-ray source passed through a patient, and for delivering an analog output x-ray image of the patient;

15 a sensor processor coupled to the image sensor receiving the analog output x-ray image from the image sensor, wherein the sensor processor interfaces with the source control unit for receiving the exposure settings of the x-ray source;

a calibrator capable of calculating the exposure settings based on the category of tooth and the physical size of the patient;

an image processor supplied with the sensor processor and the control panel for converting the analog output x-ray image received from the image sensor to a digital format image and for processing the digital format image; and

a display unit for presenting the digital format image.

- 5           12.    A method for performing dental radiography on a patient, the method comprising:

arranging an x-ray source in a desired location in relation to the mouth of the patient to be irradiated, and opposite an image sensor;

- activating the x-ray source and the image sensor in a coordinated manner, so as to  
10   avoid pre-integration of charge in the image sensor, and at the same time reduce risk of over-exposure; and

receiving at the control panel a digitally formatted x-ray image from the image sensor.

13.    A method as recited in claim 12, further comprising viewing the x-ray  
15   image from the control panel;

manipulating the x-ray image to provide a diagnosis quality image; and

storing the x-ray image.

14.    A method as recited in claim 13 further comprising measuring the exposure rate and calculating the dosage for each of multiple x-ray pictures or series.

15. A method for performing dental radiography on a patient, the method comprising:

placing the patient in the dental chair, and arranging an x-ray source in a desired location in relation to the mouth to be irradiated, and opposite an image sensor;

5 activating the x-ray source;

receiving at the control panel a digitally formatted x-ray image from the image sensor;

viewing the x-ray image from the control panel;

manipulating the x-ray image to provide a diagnosis quality image;

10 storing the x-ray image; and

measuring the exposure rate and calculating the dosage for each of multiple x-ray pictures or series.

16. The method of claim 15 further comprising providing in a remote area a portable PDA-type x-ray control panel supplied with a flat panel digital display and  
15 image manipulation software.

17. The method of claim 16 further comprising removing the control panel from its station to a different area of the dental office.

18. The method of claim 16 activating the x-ray source by pressing an exposure button located on the control panel.

19. The method of claim 15 wherein the x-ray image may be manipulated for contrast, clarity, brightness, resolution and accuracy.

20. The method of claim 16 wherein the x-ray image may be sent via a network connection to a storage database.